

Appl. No. 10/629,232
Amdt Dated Pct. 3, 2006
Reply to Office Action July 3, 2006

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

Claim 1 (currently amended): A heat sink assembly comprising:
a printed circuit board having an electronic package mounted thereon;
a retention module surrounding the electronic package, the retention module being integrally formed and defining two positioning holes at symmetrically opposite sides of a center thereof, the retention module defining an opening in a middle thereof;
two pins positioned in the positioning holes and welded to the printed circuit board;

a heat sink having a base received in the opening of the retention module and a rectangular array of pin fins extending upwardly from the base, parallel rows of the pin fins defining a plurality of parallel channels therebetween; and

a clip cooperating with the retention module to press the heat sink against the electronic package, the clip comprising a pressing portion with at least a pressing beam received in at least a corresponding channel and resting on the base of the heat sink.

Claim 2 (original): The heat sink assembly of claim 1, wherein the printed circuit board defines a pair of locating holes corresponding to the positioning holes of the retention module, and the pins are welded into the locating holes.

Claim 3 (original): The heat sink assembly of claim 2, wherein each of the pins sequentially comprises a blocking portion, a connection portion and a welding portion,

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each of said portions sequentially having successively reduced diameters, the blocking portions abut against the retention module, the connecting portions are lodged in the positioning holes and the welding portions are welded into the locating holes of the printed circuit board.

Claim 4 (currently amended): The heat sink assembly of claim 1, wherein the pressing portion of the clip comprises a plurality of pressing portion beams received in a plurality of corresponding channels and resting on the base of the heat sink for pressing the heat sink against the electronic package, and a pair of the clamping portions engaging with a bottom face of the retention module.

Claim 5 (original): The heat sink assembly of claim 4, wherein a plurality of standoffs extends from the retention module for isolating the retention module from the printed circuit board.

Claim 6 (currently amended): The heat sink assembly of claim ~~[[5]]~~4, wherein the clip is made of plastic, the clamping portions extend from respective opposite sides of the pressing portion toward the printed circuit board, and the clamping portions form distal hooks engagingly clasping the bottom face of the retention module.

Claims 7-11 (canceled)

Claim 11 (original): The heat sink assembly of claim 1, wherein the retention module is substantially rectangular, and the two positioning holes are defined in diagonally opposite corners of the retention module.

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Claim 12 (currently amended): An electronic device comprising:
a printed circuit board having an electronic package mounted thereon;
a retention module surrounding the electronic package, the retention module being integrally formed, two pins extending from the retention module to the printed circuit board and being welded to the printed circuit board, the retention module defining an opening in a middle thereof;
a heat sink having a base received in the opening of the retention module and a rectangular array of pin fins extending upwardly from the base, parallel rows of the pin fins defining a plurality of parallel channels therebetween; and
a clip cooperating with the retention module to press the heat sink against the electronic package, the clip comprising at least a pressing beam received in at least a corresponding channel and resting on the base of the heat sink.

Claim 13 (original): The heat sink assembly of claim 12, wherein the pins are disposed at symmetrically opposite sides of a center of the retention module.

Claim 14 (original): The heat sink assembly of claim 12, wherein the pins are integrally formed from or welded to a portion of the retention module facing the printed circuit board.

Claim 15 (original): The heat sink assembly of claim 12, wherein a pair of positioning holes is defined in the retention module, first ends of the pins are welded or interferentially received in the positioning holes, and opposite second ends of the pins are welded to the printed circuit board.

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Claim 16 (currently amended): A heat sink assembly comprising:

a printed circuit board with an electronic package located thereon and a plurality of through holes therein;

a retention module surrounding the electronic package with four projections diagonally extending outwardly from four corners thereof, respectively, the retention module defining an opening therein;

four pins respectively extending through said four projections of the retention module and fastened to the corresponding through holes whereby the retention module is fixed to the printed circuit board;

a heat sink defining a plurality of slots, the heat sink having a base received in the opening of the retention module, a plurality of fins extending upwardly from the base, the slots being defined between the fins;

a clip defining a rectangular frame like configuration with at least two spaced pressing bars extending through the corresponding slots in a parallel relationship and resting on the base; and

two pairs of locking devices located at two opposite sides of the clip, which are perpendicular to the pressing bars, and respectively latchably engaged with two opposite sides of the retention module, each of which is vertically aligned with the corresponding side of the clip and located between a corresponding pair of said four projections.

Claim 17 (new): The heat sink assembly of claim 3, wherein the blocking portion of each of the pins abut against the retention module above a corresponding positioning hole of the retention module.

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Claim 18 (new): The heat sink assembly of claim 5, wherein the retention module extends a plurality of fixing arms outwardly, the pins extending through corresponding fixing arms.

Claim 19 (new): The heat sink assembly of claim 17, wherein each of the standoffs extends between two corresponding adjacent fixing arms from the retention module.

Claim 20 (new): The electronic device of claim 12, wherein the pins extend through two corresponding positioning holes defined in the retention module, each of the pins comprising a blocking portion abutting against the retention module above the corresponding positioning hole, a connecting portion received in the corresponding hole, and a welding portion welded to the printed circuit board.

Claim 21 (new): The electronic device of claim 12, wherein the retention module extends a plurality of standoffs from a bottom thereof, each of the standoffs being located between two corresponding adjacent corners of the retention module.